

the effect of one star in measuring another star so near it. Obviously the best way, and the only independent one, would be to measure C from some entirely outside point.

The nearest star at all available for this purpose is D. M. $+18^\circ$, 1870, a 9.1 magnitude star, which is $286''$ from C in the direction of $108^\circ.2$. As this is nearly in the line joining A B and C (123°) it would be sufficient to measure the angle only, and this could be done with great accuracy; but the distance is so great, the resulting errors of observation might still be too large to determine whether the angular motion of C is uniform. However, some of the other pairs mentioned doubtless have convenient stars to be tested with the micrometer in this manner, for it can hardly be questioned that the same explanation will apply equally to all.

Perhaps the best independent method in the case of ζ *Canceri* would be to compare C with a neighbouring star, measuring annually the difference of declination with the meridian-circle. The changes in the place of C, according to theory, should be now, and for several years to come, principally in declination, and this should be shown by differential meridian observations covering a series of years. There is a 7.4 magnitude star 2^m following and about $1'.5$ north which would be suitable for this comparison. The position-micrometer could be used with this star to measure the difference in declination.

Lick Observatory:
1891 March 24.

A *Comparison of the North Polar Distances of the Nautical Almanac for 1880 with the Cape Catalogue, the Greenwich Ten-year Catalogue, and Boss's Standard Star Places for 1880.* By W. Grasett Thackeray.

The following comparison was made for the purpose of seeing whether the Greenwich Ten-year Catalogue Star Places for 1880 would corroborate the results of a comparison between the *Nautical Almanac* and Cape General Catalogue for 1880, given by Mr. Stone in a paper published in the *Monthly Notices*, xl. 2, pp. 57-70.

In this paper it was shown that the discordances in N.P.D. (Cape-Greenwich), arranged for every six hours of R.A., gave the following corrections after applying the general mean correction of $-0''.31$:

0^h-6^h .	6^h-12^h .	12^h-18^h .	18^h-24^h .
$-0''.24$	$-0''.11$	$+0''.39$	$+0''.06$

and it was further remarked that the observations corresponding to the result grouped under 0^h-6^h were made during the dry

3 G 2

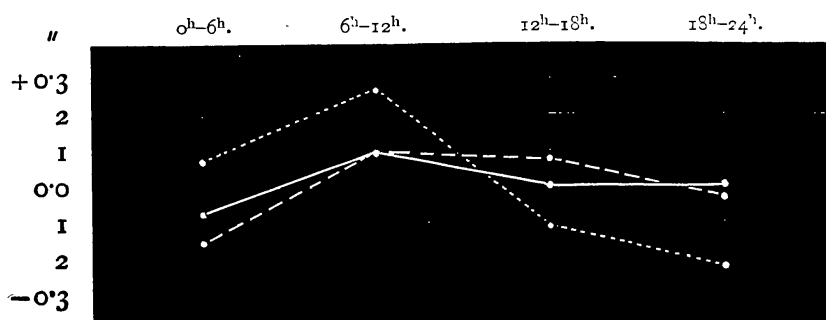
season at the Cape, and that the observations corresponding to the result grouped under 12^h–18^h were made during the wet season at the Cape. The conclusion, therefore, seemed to be that the discordances were systematic, and must be connected with the changes of temperature or moisture which take place at these different seasons at the Cape. From the present comparison it would appear that the discordances are not due to these causes.

- (1) The comparison between the *Nautical Almanac* and the Cape Catalogue for 1880 has been taken from Mr. Stone's paper, mentioned above.
- (2) The comparison between the Greenwich Ten-year Catalogue and the Cape Catalogue for 1880 depends only on the *Nautical Almanac* stars used in the above comparison. As the number of observations of each star in the Greenwich Catalogue is much greater than in the Cape Catalogue, the means were obtained by weighting the results according to the number of observations in the Cape Catalogue with a maximum weight of 10 to any one star; the results are found to be practically the same as if every star had had the same weight.
- (3) (4) (5) Boss's standard star places were obtained by applying to the *American Nautical Almanac* star places for 1880 the corrections derived from the Appendix, Table VIII., equal weights being given to every star.

	0 ^h –6 ^h .	6 ^h –12 ^h .	12 ^h –18 ^h .	18 ^h –24 ^h .	Mean.
(1) <i>N. A.</i> , 1880–Cape ...	+ "55	+ "42	– "08	+ "25	+ "31
(2) Greenwich–Cape ... (1880) (1880)	+ '36 ₄₃	+ '52 ₄₂	+ '31 ₃₅	+ '42 ₃₉	+ '40
(3) Greenwich–Boss ... (1880) (1880)	+ '30 ₂₃	+ '30 ₂₁	+ '20 ₂₀	+ '38 ₂₂	+ '30
(4) <i>N. A.</i> , 1880–Boss ... (1880)	+ '40 ₂₃	+ '27 ₂₁	– '12 ₂₀	+ '09 ₂₂	+ '16
(5) Cape, 1880–Boss ...	– '19 ₂₃	– '28 ₂₁	– '30 ₂₀	– '04 ₂₂	– '20

The subscribed figures denote the number of stars on which the results depend. Correcting each of these results for the mean error—

	0 ^h –6 ^h .	6 ^h –12 ^h .	12 ^h –18 ^h .	18 ^h –24 ^h .
Greenwich, 1880–Boss ...	"00	"00	– "10	+ "08
<i>N. A.</i> , 1880–Boss ...	+ '24	+ '11	– '28	– '07
Cape, 1880–Boss ...	+ '01	– '08	– '10	+ '16
Greenwich, 1880–Cape, 1880	– '04	+ '12	– '09	+ '02



The mean places of the stars in the *Nautical Almanac* for 1880 have been derived from the Greenwich Catalogues for 1860 and 1864, and for the stars not therein contained from the Cape Catalogue of 1,159 Stars, the first Melbourne General Catalogue, and the Cape Separate Catalogues 1871-3, and hence it would appear that the Greenwich Ten-year Catalogue places arranged in order of right ascension do not agree with those derived from the 1860 and 1864 Catalogues as given in the *N. A.*

The following comparison between the *N.A.* star places for 1880 and 1890 was made in order to compare the 1860, 1864, and 1872 Greenwich Catalogues together (the *N.A.* star places for 1890 depending on the 1872 Catalogue). The stars used in this comparison are those only which were used in Mr. Stone's paper, and the precession, secular variation, and proper motions have been taken from the Ten-year Catalogue.

The other two comparisons are obtained indirectly from the last and former comparisons.

	h h 0-6.	h h 6-12.	h h 12-18.	h h 18-24.	Mean.
<i>N. A.</i> , 1880— <i>N. A.</i> , 1890 ...	+ "13	"00	+ "18	+ "12	+ "11
Greenwich Cat., 1880— <i>N. A.</i> , 1880	- "19	+ "10	+ "39	+ "17	+ "12
Greenwich Cat., 1880— <i>N. A.</i> , 1890	- "06	+ "10	+ "57	+ "29	+ "22

From these results it would appear that the Mean North Polar distances of stars in the *Nautical Almanacs* for 1880 and 1890, which are derived from the Greenwich Catalogues for 1860, 1864, and 1872, are liable to a periodic error when arranged in order of right ascension, and that this error (probably largely due to the differences of the adopted proper motions) has been eliminated in the Ten-year Catalogue for 1880.

Approximate Proper Motions of some Groombridge Stars. By W. Grasett Thackeray.

The following Groombridge stars, which have been observed at Greenwich since 1876, and for which no proper motions are known to have been determined, were found to have proper motions either of at least $\cdot 01^s$ in right ascension or $0''\cdot 1$ in north polar distance. The proper motions have been provision-